Junshui (Jason) Ma *614-288-3593 junshuima@yahoo.com 3714 GOLD ST. APT 1, LOS ALAMOS, NM 87544*

OBJECTIVE

Tenure-Track Assistant Professor
Research Scientist
Software Engineer

SUMMARY

Systematic education in both *Electrical Engineering* and *Computer Science*; Extensive research experience in machine learning, data mining, and signal/image processing; A track record of creating innovative solutions; At least seven years of software development experience in C/C++, Matlab, Perl, and other languages; Ability to conduct research both independently and collaboratively.

EDUCATIONS

- **Ph.D., Electrical Engineering:** The Ohio State University**,** Columbus, OH, June 2001;
  Major Area: *Signal/Image Processing and Communications*
  Minor Area: *Computer Engineering*
  External Area: *Statistics*
- **M.S., Communication and Electrics Systems:** Xi'an Jiaotong University**,** China, September 1997;
- **B.S., Computer and Communication**: Xidian University**,** Xi'an, China, September 1994.

EXPERIENCES

Los Alamos National Lab (LANL) (October 2001 – Present)
Postdoctoral Research Associate

- Derived and implemented an advanced online Support Vector regression algorithm, which can be used for many areas, including prediction, modeling, and novelty detection. A journal paper (submitted) was prepared based on this work.
- Derived and implemented an online novelty detection algorithm. A journal paper (ready to submit) was prepared based on this work.
- Being one of the main investigators in a NASA project, which is to detect and identify events of interest in images and time series data collected by satellites. Until now, one journal paper (submitted) and a conference paper (published) have been prepared based on this work.
- Participating a LANL internal research-oriented project called *Real World Machine Learning*, which applies state-of-art signal/image processing and machine learning techniques to various real world applications. Until now, one journal paper (accepted) has been prepared based on this work.

The Ohio State University (December 1997 – June 2001)
Research Associate

- Derived and implemented an advanced feature processing and extraction algorithm, which is especially capable of dealing with very high dimensional patterns. A journal paper (accepted) was prepared based on this work.
- Researched into the application of Support Vector Machines (SVMs), a state-of-art algorithm in machine learning. A conference paper (published) was prepared based on this work.
- Developed a popular SVM Matlab toolbox, called *OSU SVM Classifier*, in both Matlab and C++ using the Mathworks' MEX interface technique.
- Participated in an Air Force research project, and researched into radar signal processing. Proposed a new physics model for moving target radar data, and devised two signal processing and feature extraction algorithms based on this model. A journal paper (in printing) and three conference papers (published) were prepared based on these research results.
- Designed and implemented a sequence of image processing algorithms in Matlab for a popular military image processing course.

- Designed and implemented a web-based information system, which employed the techniques of ASP, PerlScript, VBScript, SQL, ODBC, and MS Access, and involved the design of web-based GUI, security management, and database structures.

University of Nebraska at Lincoln (August 1997 – December 1997)
Teaching Assistant

- Was a teaching assistant of two high-level computer science courses in the Department of Computer Science and Engineering.

Xi'an Jiaotong University, China (September 1994 – July 1997)
Research Associate

- Designed and developed a Windows-based signal processing software package in Visual C++ using MFC. This software package incorporates almost all of the advanced signal processing algorithms. A thesis based on this work and other related research was honored as an outstanding M.S. thesis (top 10%).
- Researched into Genetic Algorithms (GAs), as well as their applications. Devised and implemented (in C) a series of refined GA operations to improve their performance. A journal paper (published) was prepared based on this work.
- Researched into Continuous Wavelet Transform (CWT), an advanced signal processing algorithm. Developed a new architecture to improve its implementation speed dramatically, and simulated the new architecture in C and Matlab. A journal paper (published) was prepared based on this work.

Shaanxi People's Educational Publishing House, China (Winter 1995, Summer 1995,and Summer 1996)
Contract Programmer

- Designed and developed a commercialized Cost Information Management System in FoxPro. This system was bought and has been used by the two largest publishing houses in Northwestern China since then.

Hualin Technology, China (Summer 1994)
Contract Programmer

- Participated a project to build supervising and controlling information network. My responsibility was programming in C for the data communication between a computer network and the online controlling equipment. The whole system has been used by Daliuta, a large mine in Northwest China.

Xidian University, China (December 1993 – July 1994)
Research Associate

- Designed and developed a network terminal for public computer communication network in Visual C++ using Object-Oriented programming technique. A thesis based on this work was honored as an outstanding B.S. thesis (top 10%).

SELECTED PUBLICATIONS

Journal Papers

- Junshui Ma, "Function Replacement vs. Kernel Trick", to appear in *Neurocomputing*, 2002.
- Junshui Ma, J. L. Sancho-G'omez, and S. C. Ahalt, "Non-linear Multi-class Discriminant Analysis," to appear in *IEEE Signal Processing Letter,* 2002.
- Junshui Ma, X. Du, and S. C. Ahalt, "2D HRR Radar Data Modeling and Processing", *Multidimensional Systems and Signal Processing,* Special issue on *Radar signal processing and its applications*, in Printing, 2002.
- Junshui Ma, and G. Liu, "A Fast Algorithm of Continuous Wavelet Transformation", *Journal of Electronics*, vol. 20, no. 2, pp 166-174, 1998.
- Junshui Ma, and G. Liu, "The Big Mutation: an Operation to Improve the Performance of Genetic Algorithms", *Control Theory & Applications*, pp 404-408, 1998.

Submitted Journal Papers

- Junshui Ma, J. Theiler, and S. Perkins, "Accurate Online Support Vector Regression," Submitted to Neural Computation, 2002.
- Junshui Ma, J. Theiler, and S. Perkins, " Two Realizations of A General Feature Extraction Framework," Submitted to Pattern Recognition, 2002.

Conference Papers

- Junshui Ma, S. Perkins, J. Theiler, and S. Ahalt, "Modified Kernel-Based Nonlinear Feature Extraction," *Proceedings of ICMLA*, pp 127-132, Las Vegas, NV, June, 2002.
- Junshui Ma, H. Li, and S. Ahalt, "Using Support Vector Machines as HRR Signature Classifiers," *Proceedings of SPIE International Symposium on Automatic Target Recognition XI*, Orlando, FL, April 15, 2001.
- Junshui Ma, and S. C. Ahalt, "Analysis of Complex HRR Range Signatures," *Proceedings of SPIE International Symposium on Targets and Backgrounds VI*, Orlando, FL, April 24-28, 2000.
- Junshui Ma, and S. C. Ahalt, "Parameter Estimation Algorithms Based on a Physics-based HRR Moving Target Model," *Proceedings of SPIE International Symposium on Algorithms for Synthetic Aperture Radar Imagery VII*, pp. 394-404, Orlando, FL, April 24-28, 2000.
- Junshui Ma, and S. C. Ahalt, "Derivation of Physics-based HRR Moving Target Model," *Proceedings of SPIE International Symposium on Signal Processing, Sensor Fusion, and Target Recognition IX*, Orlando, FL, April 24-28, 2000.
- X. Du, Junshui Ma, M. Qasem and S. C. Ahalt, "Eigen Indexing in Satellite Recognition," *Proceedings of SPIE, Vol. 3718, p. 397-405, Automatic Target Recognition IX, Apr. 1999.*

Note: Most of my publications are available online *http://nis-www.lanl.gov/~junshui/publications.html*

OTHER PROFESSIONAL ACTIVITIES

- Chaired the session of "*Feature Extraction and Classification*" in the *International Conference of Machine Learning and Applications 2002* (ICMLA'02) in Las Vegas, NV.
- Served as publication referee for the following Journals:
  - *Neurocomputing*
  - *Journal of Machine Learning Research*
- In the program committee of the *International Conference of Machine Learning and Applications 2003* (ICMLA'03) in Las Angeles, CA.